CLOSURE PLAN

FOR

SLUDGE FILTER BEDS

AT

SKF ROLLER BEARINGS DIVISION
SKF INDUSTRIES, INC.
WEST KING STREET
SHIPPENSBURG, PENNSYLVANIA

SEPTEMBER, 1984

PREPARED BY
LANCY LABORATORIES DIVISION
LANCY INTERNATIONAL, INCORPORATED

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APPENDICES

1.0 INTRODUCTION

The SKF Roller Bearings Division of SKF Industries located in Shippensburg, Pennsylvania, is submitting this closure plan for two concrete block sludge filter beds in accordance with applicable U.S. Environmental Protection Agency regulations set forth in RCRA (40 CFR 265.110-265.120) and the State of Pennsylvania Hazardous Waste Regulations, Section 75.264.(o). The plan outlines the necessary requirements to minimize the need for further maintenance and to minimize any adverse effects to human health and the environment.

The sludge filter beds were installed in 1964 and, prior to their elimination from the waste treatment system in October, 1983, were utilized as a final step in the treatment of chemically-treated wastes and floor spills from the plating and bright dip process as well as untreated waste from the phosphatizing processes.

In anticipation of closing the sludge beds and installing a new waste treatment system, a preliminary site investigation was conducted by SKF in June, 1983 to determine if any migration of contaminants to the environment had occurred. These preliminary test results indicated low levels of metals in leachate from soil samples taken around the bed. In a meeting with the Pennsylvania Department of Environmental Resources (PADER) in April, 1984, it was determined that a minimal additional sampling program would be required prior to closure to further substantiate that migration of contamination is not occurring. In June, 1984, a second sampling program was conducted in and around the sludge filter beds. The results of this site evaluation were utilized to develop the approach to closure discussed in the following sections.

2.0 APPROACH TO CLOSURE

2.1 Closure Performance Standard

This closure plan was designed to ensure that: 1) the site of the sludge beds will not require further maintenance and controls (outside of those provided), 2) threats to human health and environment are minimized or eliminated, and 3) escape of hazardous waste, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the ground or surface waters or the atmosphere are minimized.

The following sections discuss in detail, efforts to be made at the SKF Roller Bearing Division, Shippensburg, PA facility to satisfy the closure performance standard.

2.2 Proposed Method of Closure

The proposed method of closure for the sludge beds at SKF Industries was determined through a review and evaluation of soil analysis data generated in June, 1983 by Nassaux-Hemsley, Incorporated and further substantiated by soil samples taken in June, 1984 by Lancy Laboratories, Division, Lancy International, Inc. In addition, a review of local industrial practices and existing geological information on the area were utilized in the determination. Based upon this evaluation, our proposed approach to closure is to remove the sludge bed structures and a 3 foot layer of soil from beneath the sludge beds which has been contaminated by inadvertent discharges of tricloroethylene (TCE) into the sludge beds. If all contaminated soils and structures are removed, it is SKF Industries' understanding that according to regulations, they will be subject to only minimal post-closure care requirements. It is anticipated that verification testing will show no contamination of remaining soils.

The following sections discuss in detail, efforts to be made at the SKF Roller Bearing Division, Shippensburg, PA facility to satisfy the closure performance standard.

3.0 FACILITY DESCRIPTION

3.1 Sludge Filter Beds

The two sludge filter beds at the SKF Industries facility are located just outside the inspection room at the southwest corner of the building. (See Figure 3-1). The beds were put into operation in the 1960's and used primarily to settle and filter accumulated sludges from the Alkaline and Acid Batch Treatment Systems. Sludge was collected in the beds with the supernatant permeating through the porous block walls of the beds. This effluent was collected in a tile drain system and discharged under permit to an underground injection well. The sludge was periodically removed and disposed off-site. Use of the sludge filter beds was discontinued in 1983 with the installation of above ground holding tanks for the sludge. The two beds encompass an area of approximately 360 square feet.

3.2 Geologic Setting

The SKF facility is situated in the rolling lowland Cumberland Valley which represents the middle section of the Great Valley which extends over 900 miles between New York and Alabama. The structure of the Cumberland Valley consists of a series of complex asymmetrical folds, several cross faults, and east-dipping and a few west-dipping reverse faults.

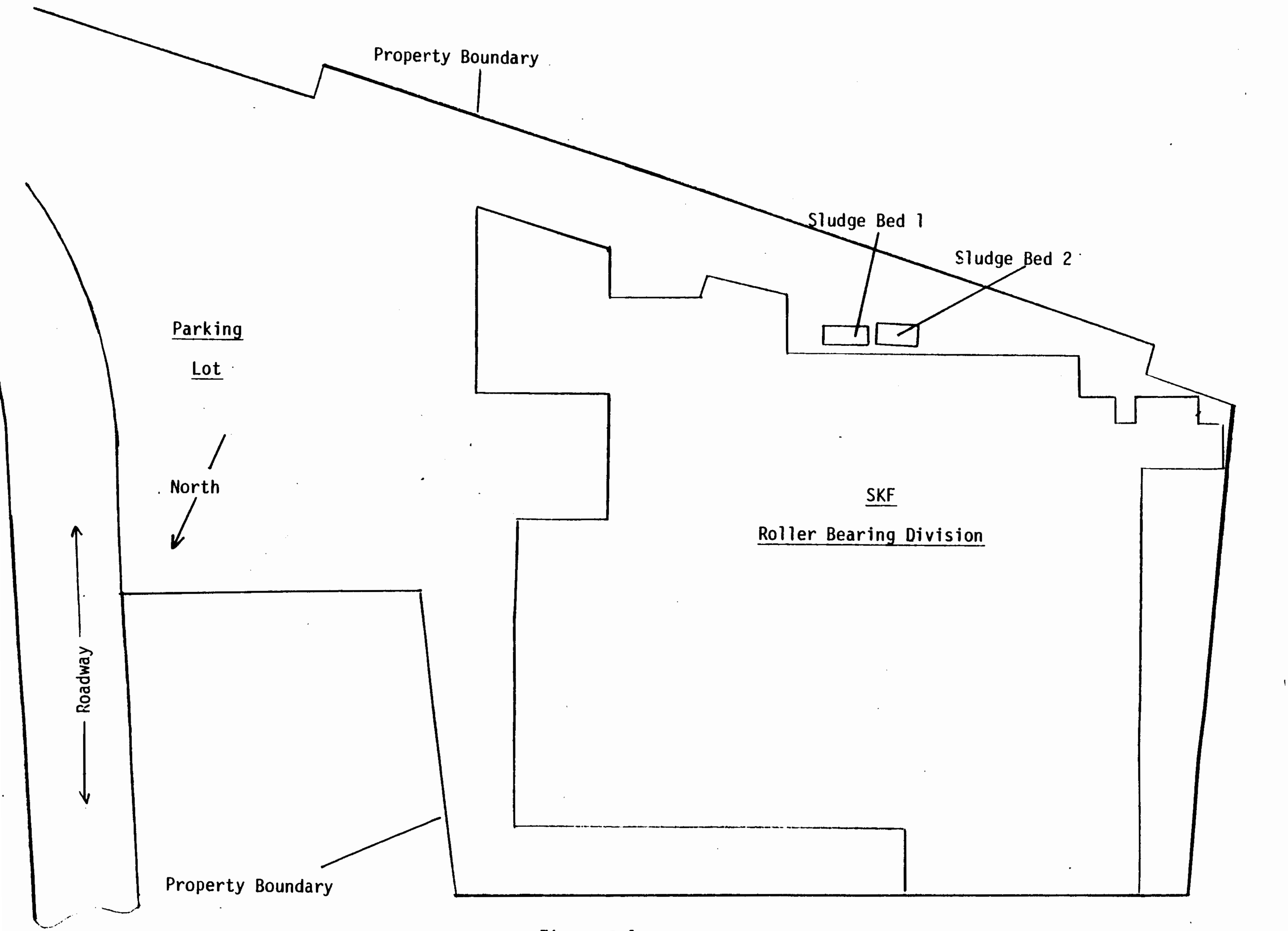
Property Boundary
Sludge Bed 1
Sludge Bed 2
Parking
Lot
North
Roadway
SKF
Roller Bearing Division
Property Boundary

Figure 3-1

The underlying bedrock at the SKF facility consists of the Rockdale Run Formation of the Beekmantown Group. This formation is predominantly a light to medium gray limestone estimated to be 2200-3000 feet thick. Hand auger sample borings collected in June, 1984 indicated a dark brown, sandy soil for the first two and one half feet giving way to an orange clay. The sludge beds were constructed directly on top of the orange clay layer with the clay extending to a minimum depth of three (3) feet beneath the bottom of the beds.

4.0 SITE EVALUATION

The purpose of the site evaluation was to determine the extent of soil contamination, if any, in the area of the filter beds. This was accomplished through a review of existing analytical data, background information on soils indigenous to the local area, and on-site sampling and analyses to determine the extent contamination.

4.1 Sampling

The sampling plan employed was developed based on guidelines generally agreed upon at a meeting on April 27, 1984 between PADER, SKF Industries, and their consultant, Lancy Laboratories. The objective was to substantiate existing data collected in 1983. The study consisted of an additional three composite samples from soil borings in and around the sludge filter beds.

The sampling plan developed to accomplish these requirements consisted of collecting soil samples in the following areas:

- Beneath the sludge filter beds
- The area in which the 1983 samples were obtained
- Background (Upgradient)

Samples from several soil borings in each area were composited to form one sample representative of that area. Soil boring locations are shown in Figure 4-1. Composite sample #1 characterizes the soils beneath the sludge beds. Samples were collected from four (4) soil borings (two in each bed) and composited (equal volumes). Samples were collected three (3) feet below the gravel layer under the concrete base. Composite sample #3 characterizes the soils in the general area around the sludge beds. Sample #3 consists of samples obtained from three soil borings approximating 1983 sampling locations. The samples from each boring were collected at a depth of approximately three feet.

Sample #4 was collected from a soil boring characterizing upgradient, background soil conditions. The boring was located approximately 30 feet south of the southern corner of bed #2 along the property fence line. A composite sample (labelled #2) was also prepared from two (2) samples collected in the area between the beds and the building, as contingency samples in the event that significant differences should be found between the data obtained from this sampling program and the 1983 data.

Sampling was accomplished by a trained field technician. All samples were composited on-site, transferred to wide-mouth glass jars, and preserved by refrigeration in the field at the time of sampling.

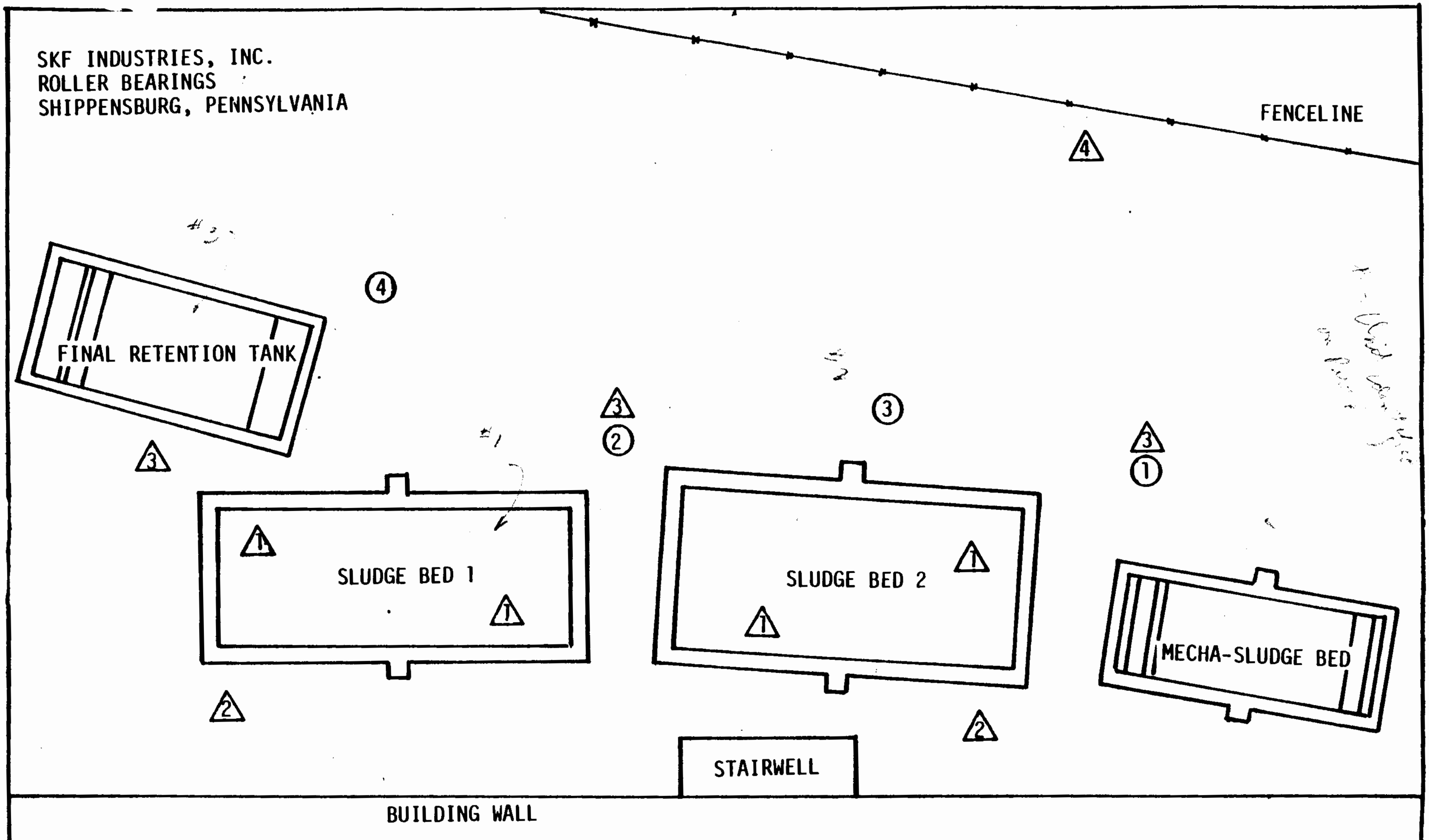

FIGURE 4-1
SOIL BORING LOCATIONS

○ = NASSAUX-HEMSLEY SOIL SAMPLES (1983)
△ = LANCY LABORATORIES SOIL COMPOSITE SAMPLES (1984)

APPROXIMATE SCALE: 1" = 12'

4.2 Analysis

Samples collected as described above were analyzed for metals, cyanide, and leaching characteristics as measured by ASTM Standard D3987, Method A, distilled water leach, as requested by PADER. The following parameters were measured on both the composite soil samples and the leachate:

Cyanide, Total	Lead
Arsenic	Mercury
Barium	Nickel
Cadmium	Selenium
Chromium	Silver
Copper	Zinc
Iron	

Analyses were performed using methods published in SW846 (2nd Edition), "Methods for Evaluating Solid Wastes", or methods specifically approved by the United States EPA.

In addition, soil samples were analyzed for volatile organics since some indications of low levels of trichloroethylene had previously been found in the plant effluent and water supply well. The methodology utilized for these analyses was a Purge and Trap gas chromatographic technique on a slurry of the soil sample in deionized water pretreated by ultrasonic mixing for two minutes. (No standard EPA methods exist for this type of analysis at present, but the procedure employed is one of several under evaluation by USEPA.)

4.3 Discussion of Data

Analytical data generated from the soil samples for this investigation are included as Appendix A. Data on the leachate analyses are summarized in Figures 4-1 and 4-2. Results of the 1984 analyses on the leachate from the soil samples (Composite #3) are in general agreement with results from 1983 samples. Both sets of data show low concentrations of constituents of environmental significance in the leachate. The total metals analyses on the soil, however, do indicate differences between the 1983 and 1984 data, with the 1984 data showing considerably higher metals contents in general. This may be a result of differences in sample preparation techniques. The soil samples obtained during the 1983 program (by Nassaux-Hemsley, Inc.) were reported to have been prepared using a nitric acid digestion procedure at a pH of 2. The 1984 data were obtained from samples prepared by a concentrated nitric acid digestion (by Lancy Laboratories). Therefore, a direct comparison of the data obtained in 1983 and 1984 may not reflect actual changes in soil metals content.

The leachate data obtained from the analysis of composite sample #3, taken in June, 1984 were compared to the average of the data from samples B1 through B4 from the 1983 sampling program which were taken from the same area as composite sample #3 (1984). A review of the data (summarized in Table 4-1) does not indicate any significant differences between the two survey periods and confirms no significant levels of leachate contaminants.

Composite sample #4, taken of background soil, provides a reference point for the comparison of natural soil mineralization with metals accumulation potentially caused by the discharge from the sludge

TABLE 4-1

Summary of Leachate Analytical Results
ASTM Standard D3987
Method A

Parameters	Leachate Concentration (mg/L)						
	Nassaux-Hemsley (1983) Soil Borings				Lancy Laboratories (1984) Soil Borings		
	B1	B2	B3	B4	Sludge Bed Composite #1	Composite #3	Background #4
Iron, Total	7.9	27.5	<0.1	0.1	172	10	2.8
Chromium, Total	0.1	0.1	<0.1	<0.1	0.16	0.06	<0.05
Chromium, Hexavalent	<0.01	<0.01	<0.01	<0.01	---	---	---
Copper, Total	5.3	6.8	0.8	1.8	2.5	1.9	0.04
Zinc, Total	3.9	4.7	1.9	2.8	4.8	3.2	0.07
Arsenic, Total	0.154	0.281	0.103	0.083	0.038	0.008	<0.005
Cadmium, Total	0.7	3.9	<0.1	0.1	0.01	0.01	0.01
Lead, Total	1.3	0.6	<0.1	<0.1	0.30	0.05	<0.05
Nickel, Total	<0.1	<0.1	<0.1	<0.1	0.32	0.29	0.09
Silver, Total	<0.1	0.1	<0.1	0.181	0.02	0.07	<0.01
Tin, Total	0.177	0.496	0.157	---	---	---	---
Cyanide, Total	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01
Barium, Total	---	---	---	---	1.4	0.7	2.8
Mercury, Total	---	---	---	---	0.002	<0.001	<0.001
Selenium, Total	---	---	---	---	<0.005	<0.005	<0.005

TABLE 4-2

Comparison of Leachate Analytical Results
ASTM Standard D3987
Method A

Parameters	Leachate Concentration (mg/L)	
	Nassaux-Hemsley (1983)[a] Average of Soil Borings B1-B4	Lancy Laboratories (1984)[b] Soil Composite #3
Iron, Total	8.9	10
Chromium, Total	<0.1	0.06
Chromium, Hexavalent	<0.01	---
Copper, Total	3.68	1.9
Zinc, Total	3.3	3.2
Arsenic, Total	0.155	0.008
Cadmium, Total	1.18	0.01
Lead, Total	0.98	0.05
Nickel, Total	<0.1	0.29
Silver, Total	<0.1	0.07
Tin, Total	0.277	---
Cyanide, Total	<0.01	<0.01
Barium, Total	---	0.7
Mercury, Total	---	<0.001
Selenium, Total	---	<0.005

NOTE: (a) Average concentration (mg/L) of soil borings B1-B4 collected by Nassaux-Hemsley June 1983.

(b) Soil composite sample #3 collected by Lancy Laboratories on June 5, 1984 filter beds. As expected, these data show a somewhat higher level of metals accumulated in and leachable from the soils in the vicinity of the sludge beds. The leachable concentrations are, however, too low to present any significant potential for contamination of groundwater.

Trichloroethylene (TCE) has been in use at at the SKF facility and may have previously been inadvertently discharged to the sludge filter beds. Analysis of the soil samples collected in June, 1984 indicates that trichloroethylene is present in the soils beneath the sludge filter beds. However, analyses of samples #2 and #3, characterizing the soils around the sludge beds, do not indicate any significant concentration of TCE and, in effect, demonstrate concentrations less than that found in the background sample (#4). The complete data are given in Appendix A, and TCE analyses are summarized in Table 4-3.

TABLE 4-3

Trichloroethylene in Soil Samples

units = ug/Kg

Composite #1 Beneath Sludge Beds	Composite #2 Between Beds & Bldg.	Composite #3 Area Around Beds	Boring #4 Background
215,000	175	155	280

In summary, the site evaluation data show no significant soil contamination based on leachable metals content, indicating in-situ closure to be the best approach. However, due to the presence of significant trichloroethylene concentration in soils beneath the sludge beds, closure will include removal of the sludge bed structures and three feet of underlying soils. Due to the presence of a clay layer in this area, no appreciable migration to lower levels is anticipated. This will be determined by verification testing following excavation.

5.0 CLOSURE ACTIVITIES

Closure activities have been determined based upon information obtained from the site evaluation. In general, closure activities will include:

- o Dismantling and disposal of the two (2) sludge filter beds (construction materials)
- o soil removal to a depth of three (3) feet beneath the two (2) sludge filter beds
- o verification testing
- o clean-up and decontamination of facility equipment
- o site restoration
- o certification of closure by registered professional engineer

The intended approach to closure of the sludge filter beds is to remove all contaminated materials.

SKF proposes to dispose of both the concrete and gravel that form the actual structure of the filter beds and to remove three (3) feet of soil below the sludge filter beds to a hazardous waste facility liscensed to accept solid waste containing residues of chlorinated solvents.

Once this is complete, verification testing will be performed on the soil layer exposed by the excavation to assure that all significant contamination associated with sludge bedsusage has been removed. Contamination, for the purposes of this verification testings will be defined as TCE concentrations in the soil exceeding 300 ug/L, the approximate measured background level of TCE. The method of determination will be that described in section 4.2.

5.1 Maximum Waste Inventory

The concrete block sludge filter beds were utilized as an integral part of SKF Industries treatment system during the period of 1964 to 1983. In October, 1983, these filter beds were eliminated from the treatment scheme with all waste (sludge) removed and hauled off-site for disposal at a licensed facility. Therefore, no actual wastes will be removed during this closure. The estimated quantity of soil to be removed is approximately 50 cubic yards.

5.2 Removal of Structures and Soil

All closure activities will be performed by experienced contractors and supervised by qualified technical personnel. If warranted, those personnel involved in removing these materials will be provided with personal protection equipment including coveralls, head protection, gloves, and boots. Other safety equipment, such as respirators, will be available at the site in the event of any unforseen hazardous conditions during removal activities.

The concrete block structure will be broken-up and excavated by a local contractor under the supervision of SKF personnel. Soil removal will be accomplished by backhoe and dump trailer. All materials removed will be transported by a licensed hauler to a licensed hazardous waste facility for disposal.

5.3 Verification Testing

Following excavation, soil samples will be taken at one (1) foot below the newly exposed soil surface at two (2) locations from the site of each bed. These four (4) soil samples will be transferred to wide-mouth glass jars, refrigerated, and transported to a laboratory for analysis for trichloroethylene. If results of these analyses verify that the remaining soil is not significantly contaminated, i.e. TCE concentration < 300 ug/L, closure will proceed with site restoration. If significant contaminant levels are found in the remaining soil, a revision of closure plans may be required.

5.4 Decontamination of Equipment

Following completion of excavation actiivities and collection of soil samples for verification testing, all equipment used in the removal process will be decontaminated on-site. The decontamination process will primarily include cleaning all heavy equipment such as back hoes with water. All decontamination operations will occur in a contained area. Any wastewater generated during this process will be collected in 55 gallon drums and will be disposed of with the other materials at a licensed hazardous waste disposal facility.

Prior to leaving any of the site locations undergoing closure, personnel decontamination will be conducted by removing all bulk material from boots and washing all outside protective clothing materials as well as exposed skin surfaces. All wash water will be collected in drums with the other decontamination wastewater and disposed of at a licensed hazardous waste facility.

5.5 Site Restoration

Once all materials and physical controls have been removed from the sludge filter bed area, site reclamation will be necessary to control erosion, drainage, and wind blown dust as well as for safety, aesthetic, and end-use considerations. In general, the cover material must function primarily to:

- prevent runoff
- prevent erosion
- support construction and/or vehicles

It is intended that the site be restored by backfilling in preparation for future construction.

5.6 Schedule of Closure

SKF Industries plans to initiate physical closure activities in March, 1985 or before, pending PADER approval. It is estimated that closure can be accomplished well within the allotted six (6) month time period. SKF does not anticipate that an extension of time will be required. However, if major changes to the final plan are necessary, or if situations beyond the control of SKF Industries (force majeure) occur, closure time may need to be extended.

6.0 CLOSURE AND POST CLOSURE COST ESTIMATES

The cost estimates for closure, as outlined in Table 6-1, are based upon an assumption that between 100 and 130 cubic yards of material (structure and soil) will be excavated and removed off-site to a licensed hazardous waste disposal facility.

Elements which make up the cost factors include:

- o site evaluation including sampling and analysis
- o development of closure plan
- o management of closure activities
- o sludge bed removal, transportation, and disposal
- o contaminated soil removal, transportation, and disposal
- o verification of closure
- o site restoration
- o certification of closure

Post-closure care is anticipated to be minimal since all contaminated materials are being removed off-site. It should not be necessary to install additional groundwater monitoring wells. The area will be returned to its natural state. Periodic analysis of the existing water well should be sufficient to insure that no unforseen contamination arises.

TABLE 6-1

CLOSURE COST ESTIMATES

Item		Cost Estimates
I.	Site Evaluation Including Sampling and Analysis	$ 3,500
II.	Development of Closure Plan (including interpretation of the regulations, review of site data and preparation of all required documentation.)	$ 3,000
III.	Management of Closure Activities (Including contracting bid solicitation, qualifications of contractors, logistics, scheduling, and supervision of closure activities)	$ 4,000
IV.	Sludge Filter Bed Structure and Contaminated Soil Removal, Transportation and Disposal ($110 - $130/Cu yd)	$12,000-$17,000
V.	Verification Testing (including sampling and analysis)	$ 3,000
VI.	Site Restoration A. Materials and labor ($45/hr) B. Transportation ($40/cubic yard)	$ 5,000-$9,000
VII	Certification of Closure including PE Review	$1,000

7.0 REQUIRED NOTIFICATIONS

7.1 Notice in Deed and Notice to Local Authority

Since all materials classified as hazardous are being removed from the site during closure, no notice in deed or notice to local authorities will be required.

7.2 Financial Assurance Mechanism for Closure

SKF is cognizant of its responsibilities with regard to financial assurance for closure and has selected the mechanism given in Appendix B.

7.3 Liability Insurance

SKF has addressed the requirements for liability insurance. See Appendix C.

8.0 CERTIFICATION

To ensure that closure of the filter beds has been completed as outlined in the closure plan and in accordance with the regulations set forth, an inspection of the facility will be made by a Pennsylvania registered professional engineer during closure.

The certifications on the following pages will be utilized at the time of closure.

OWNER CERTIFICATION OF CLOSURE

I, ____, of

(Owner or Operator)

____ hereby

(Name and Address of Facility)

state and certify that, to the best of my knowledge and belief, the ______ ________________________ at the above named facility has been closed in accordance with the regulations and the facility's closure plan, and that closure was completed on the ________ day of ________________________, 19____.

________________________________ ________________

Signature Date

PROFESSIONAL ENGINEER CERTIFICATION OF CLOSURE

I, ____, a registered

(Name)

professional engineer, hereby certify, to the best of my knowledge and belief, that I have made visual inspection(s) of the

________________________, and closure of the ____________________

(Name and Address of Facility)

has been performed in accordance with the regulations and the facility's closure plan.

________________________________ ________________

Signature Date

________________________________ ________________

Professional Engineering License Number For State Of

____

Business Address and Telephone Number

APPENDIX A

ANALYTICAL DATA

ANALYSIS REPORT

LANCY LABORATORIES
Division, Lancy International, Inc.
525 W. New Castle St., P.O. Box 490
Zelienople, Pennsylvania 16063

Report Date 7/23/84

SKF Roller Bearings
West King Street
Shippensburg, PA 17257

Attention: Thomas Taylor

Collected 6/5/84 by MM
Received 6/11/84 by LS
Analyzed 6/11 to 7/13/84 by Staff
No. of Samples 6
P.O. # 4-001286

Soil Boring Samples and ASTM Leachates
from Sludge Filter Beds Areas

Sample Lab Reference # Parameter	Composite #1 08437 (mg/Kg)	ASTM Leachate 08438 (mg/L)	Composite #3 08439 (mg/Kg)	ASTM Leachate 08440 (mg/L)
Cyanide, Total	0.45	<0.02	1.00	<0.01
Arsenic	9	0.038	7	0.008
Barium	130	1.4	220	0.7
Cadmium	1.5	0.01	3.3	0.01
Chromium	36	0.16	50	0.06
Copper	380	2.5	2300	1.9
Iron	19000	172	13000	10
Lead	45	0.30	46	0.05
Mercury	0.057	0.002	0.12	<0.001
Nickel	47	0.32	120	0.29
Selenium	<1	<0.005	<1	<0.005
Silver	2.3	0.02	90	0.07
Zinc	850	4.8	1100	3.2

C. John Ritzert, Manager-Analytical Services

ANALYSIS REPORT

LANCY LABORATORIES
Division, Lancy International, Inc.

Company: SKF Roller Bearings — Report Date: 7/23/84

Description: Boring Samples and ASTM Leachates — PO#/Chg.#: 4-001286

Sample	Boring #4	ASTM Leachate
Lab Reference #	08441 (mg/Kg)	08442 (mg/L)
Parameter		
Cyanide, Total	<0.37	<0.01
Arsenic	6	<0.005
Barium	190	2.8
Cadmium	1.9	0.01
Chromium	19	<0.05
Copper	250	0.04
Iron	15400	2.8
Lead	56	<0.05
Mercury	0.100	<0.100
Nickel	38	0.09
Selenium	<1	<0.005
Silver	4.9	<0.01
Zinc	260	0.07

C. John Ritzert, Manager-Analytical Services

ANALYSIS REPORT

LANCY LABORATORIES
Division, Lancy International, Inc.

Company: SKF Roller Bearing — Report Date: 7/30/84

Description: Soil Boring Samples from Sludge Filer Beds Area — PO#/Chg.#: 4-001286

Sample Lab Reference #	Composite #1 08437 (ug/Kg)	Composite #2 08820 (ug/Kg)	Composite #3 08439 (ug/Kg)	Boring #4 08441 (ug/Kg)
Parameter				
Benzene	<5	36	<5	<5
Bis(Chloromethyl)Ether	<5	<5	<5	<5
Bromoform	<5	<5	<5	<5
Carbon Tetrachloride	<5	<5	<5	<5
Chlorobenzene	<5	<5	<5	<5
Chlorodibromomethane	<5	<5	<5	<5
Chloroethane	<5	<5	<5	<5
2-Chloroethylvinyl Ether	<5	<5	<5	<5
Chloroform	980	<5	<5	<5
Dichlorobromomethane	<5	<5	<5	<5
Dichlorodifluoromethane	<5	<5	<5	<5
1,1-Dichloroethane	<5	<5	<5	<5
1,2-Dichloroethane	<5	<5	<5	<5
1,1-Dichloroethylene	<5	<5	<5	<5
1,2-Dichloropropane	<5	<5	<5	<5
1,3-Dichloropropylene	<5	<5	<5	<5
Ethylbenzene	<5	<5	<5	<5
Methyl Bromide	<5	<5	<5	<5
Methyl Chloride	<5	<5	<5	<5
Methylene Chloride	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	<5	<5	<5	<5
Toluene	<5	90	<5	<5
1,2-Trans-Dichloroethylene	<5	<5	<5	<5
1,1,1-Trichloroethane	<5	<5	<5	<5
1,1,2-Trichloroethane	<5	<5	<5	<5
Trichloroethylene	215000	175	155	280
Trichlorofluoromethane	<5	<5	<5	<5
Tetrachloroethylene	4670	<5	<5	<5

C. John Ritzert, Manager-Analytical Services

NH NASSAUX-HEMSLEY, INCORPORATED
CONSULTING ENGINEERS — CHAMBERSBURG, PA.

LABORATORY REPORT

DATE IN: June 6, 1983 — DATE REPORTED: June 20, 1983

LAB NO. 724.1 (B 1) — JOB NO. 83LB01.04

CLIENT: SKF Industries — PROJECT MANAGER: R. Matter

EPA Leachable Metals

All values are expressed as mg/l (ppm) unless otherwise noted.

MICROBIOLOGICAL		OXYGEN-OXYGEN DEMAND		METALS	
Total Coliforms		Dissolved Oxygen		Iron (Total)	7.9
Fecal Coliforms		5 Day - B.O.D.		Chromium (Total)	0.1
		C.O.D.		Chromium (Hexaval)	<0.01
				Copper	5.3
				Zinc	3.9
ALKALINITY AND RELATED		**SOLIDS**		Aresnic	0.154
pH	9.2	Total		cadmium	0.7
P-Alkalinity		Suspended		Lead	1.3
M.O. Alkalinity		Total Vol.		Nickel	<0.1
Total Hardness		Total Fixed		Silver	<0.1
Total Acidity		Susp. Vol.		Tin	0.177
				OTHER	
pH 8 Acidity		Susp. Fixed		Chloride	
		Settled 1 Hr.		Ammonia Nitrogen	
				Nitrate Nitrogen	
				Nitrite Nitrogen	
				Oil - Grease	
				CN	<0.01

COMMENTS

1. All analysis via Standard Methods, 14th Edition (1975) or EPA Methods Manual (1974), unless otherwise noted.

Respectfully Submitted,

NH **NASSAUX-HEMSLEY, INCORPORATED**

CONSULTING ENGINEERS — CHAMBERSBURG, PA.

LABORATORY REPORT

DATE IN	June 6, 1983	DATE REPORTED	June 20, 1983
LAB NO.	724.1A (B 1)	JOB NO.	83LB01.14
CLIENT	SKF Industries	PROJECT MANAGER	R. Matter
	Digested Soil Composite		

All values are expressed as mg/l (ppm) unless otherwise noted.

MICROBIOLOGICAL	
Total Coliforms	
Fecal Coliforms	

OXYGEN-OXYGEN DEMAND	
Dissolved Oxygen	
5 Day - B.O.D.	
C.O.D.	

*METALS	
Iron (Total)	57.9
Chromium (Total)	0.6
Chromium (Hexaval)	<0.01
Copper	6.1
Zinc	3.9
Arsenic	0.925
Cadmium	0.1
Lead	8.3
Nickel	0.5
Silver	0.1
Tin	0.963

ALKALINITY AND RELATED	
pH	9.2
P-Alkalinity	
M.O. Alkalinity	
Total Hardness	
Total Acidity	
pH 8 Acidity	

SOLIDS	
Total	
Suspended	
Total Vol.	
Total Fixed	
Susp. Vol.	
Susp. Fixed	
Settled 1 Hr.	

OTHER	
Chloride	
Ammonia Nitrogen	
Nitrate Nitrogen	
Nitrite Nitrogen	
Oil - Grease	
CN	<0.01

COMMENTS

1. All analysis via Standard Methods, 14th Edition (1975) or EPA Methods Manual (1974), unless otherwise noted.

* Digested 160 gr. of composite soil to a pH of <2.0 with HNO_3.

Results are expressed in mg/Kg of soil.

Respectfully Submitted,

NH NASSAUX-HEMSLEY, INCORPORATED

CONSULTING ENGINEERS — CHAMBERSBURG, PA.

LABORATORY REPORT

DATE IN	June 6, 1983	DATE REPORTED	June 20, 1983
LAB NO.	724.2A (B-2)	JOB NO.	83LB01.14
CLIENT	SKF Industries	PROJECT MANAGER	R. Matter
	Digested Soil Composite		

All values are expressed as mg/l (ppm) unless otherwise noted.

MICROBIOLOGICAL		OXYGEN-OXYGEN DEMAND		* METALS	
Total Coliforms		Dissolved Oxygen		Iron (Total)	61.3
Fecal Coliforms		5 Day - B.O.D.		Chromium (Total)	1.0
		C.O.D.		Chromium (Hexaval)	<0.01
				Copper	7.9
				Zinc	3.7

ALKALINITY AND RELATED		SOLIDS			
pH	9.5	Total		Arsenic	1.5
P-Alkalinity		Suspended		Cadmium	0.1
M.O. Alkalinity		Total Vol.		Lead	4.3
Total Hardness		Total Fixed		Nickel	1.2
Total Acidity		Susp. Vol.		Silver	0.1
pH 8 Acidity		Susp. Fixed		Tin	0.898
		Settled 1 Hr.			

OTHER	
Chloride	
Ammonia Nitrogen	
Nitrate Nitrogen	
Nitrite Nitrogen	
Oil - Grease	
CN	<0.01

COMMENTS

1. All analysis via Standard Methods, 14th Edition (1975) or EPA Methods Manual (1974), unless otherwise noted.

* Digested 160 gr. of composite soil to a pH of 2.0 with HNO_3.
Results are expressed in mg/Kg of soil.

Respectfully Submitted,

NASSAUX-HEMSLEY, INCORPORATED

CONSULTING ENGINEERS CHAMBERSBURG, PA.

LABORATORY REPORT

DATE IN: June 6, 1983 DATE REPORTED: June 20, 1983

LAB NO.: 724.2 (B-2) JOB NO.: 83LB01.14

CLIENT: SKF Industries PROJECT MANAGER: R. Matter

EPA Leachable Metals

All values are expressed as mg/l (ppm) unless otherwise noted.

MICROBIOLOGICAL		OXYGEN-OXYGEN DEMAND		METALS	
Total Coliforms		Dissolved Oxygen		Iron (Total)	27.5
Fecal Coliforms		5 Day - B.O.D.		Chromium (Total)	0.1
		C.O.D.		Chromium (Hexaval)	<0.01
				Copper	6.8
				Zinc	4.7

ALKALINITY AND RELATED		SOLIDS		METALS	
				Arsenic	0.281
pH	9.5	Total		Cadmium	3.9
P-Alkalinity		Suspended		Lead	0.6
M.O. Alkalinity		Total Vol.		Nickel	<0.1
Total Hardness		Total Fixed		Silver	0.1
Total Acidity		Susp. Vol.		Tin	0.496
pH 8 Acidity		Susp. Fixed		**OTHER**	
		Settled 1 Hr.		Chloride	
				Ammonia Nitrogen	
				Nitrate Nitrogen	
				Nitrite Nitrogen	
				Oil - Grease	
				CN	<0.01

COMMENTS

1. All analysis via Standard Methods, 14th Edition (1975) or EPA Methods Manual (1974), unless otherwise noted.

Respectfully Submitted,

NASSAUX-HEMSLEY, INCORPORATED

CONSULTING ENGINEERS — CHAMBERSBURG, PA.

LABORATORY REPORT

DATE IN	June 6, 1983	DATE REPORTED	June 20,1983
LAB NO.	724.3A (B-3)	JOB NO.	83LB01.14
CLIENT	SKF Industries	PROJECT MANAGER	R. Matter
	Digested Soil Composite		

All values are expressed as mg/l (ppm) unless otherwise noted.

MICROBIOLOGICAL		OXYGEN-OXYGEN DEMAND		* METALS	
Total Coliforms		Dissolved Oxygen		Iron (Total)	53.7
Fecal Coliforms		5 Day - B.O.D.		Chromium (Total)	0.7
		C.O.D.		Chromium (Hexaval)	<0.01
				Copper	9.2
				Zinc	5.1

ALKALINITY AND RELATED		SOLIDS		METALS (cont.)	
pH	9.5	Total		Arsenic	1.51
P-Alkalinity		Suspended		Cadmium	<0.1
M.O. Alkalinity		Total Vol.		Lead	6.7
Total Hardness		Total Fixed		Nickel	0.6
Total Acidity		Susp. Vol.		Silver	0.1
pH 8 Acidity		Susp. Fixed		Tin	1.232
		Settled 1 Hr.			

OTHER	
Chloride	
Ammonia Nitrogen	
Nitrate Nitrogen	
Nitrite Nitrogen	
Oil - Grease	
CN	<0.01

COMMENTS

1. All analysis via Standard Methods, 14th Edition (1975) or EPA Methods Manual (1974), unless otherwise noted.

* Digested 160 gr. of composite soil to a pH of 2.0 with HNO_3.
Results are expressed in mg/Kg of soil.

Respectfully Submitted,

NH **NASSAUX-HEMSLEY, INCORPORATED**

CONSULTING ENGINEERS CHAMBERSBURG, PA.

LABORATORY REPORT

DATE IN	June 6, 1983	DATE REPORTED	June 20, 1983
LAB NO.	724.3 (B-3)	JOB NO.	83LB01.14
CLIENT	EPA Leachable Metals	PROJECT MANAGER	R. Matter

All values are expressed as mg/l (ppm) unless otherwise noted.

MICROBIOLOGICAL	
Total Coliforms	
Fecal Coliforms	

OXYGEN-OXYGEN DEMAND	
Dissolved Oxygen	
5 Day - B.O.D.	
C.O.D.	

METALS	
Iron (Total)	<0.1
Chromium (Total)	<0.1
Chromium (Hexaval)	<0.01
Copper	0.8
Zinc	1.9
Arsenic	0.103
Cadmium	<0.1
Lead	<0.1
Nickel	<0.1
Silver	<0.1
Tin	0.157

ALKALINITY AND RELATED	
pH	9.5
P-Alkalinity	
M.O. Alkalinity	
Total Hardness	
Total Acidity	
pH 8 Acidity	

SOLIDS	
Total	
Suspended	
Total Vol.	
Total Fixed	
Susp. Vol.	
Susp. Fixed	
Settled 1 Hr.	

OTHER	
Chloride	
Ammonia Nitrogen	
Nitrate Nitrogen	
Nitrite Nitrogen	
Oil - Grease	
CN	<0.01

COMMENTS

1. All analysis via Standard Methods, 14th Edition (1975) or EPA Methods Manual (1974), unless otherwise noted.

Respectfully Submitted,

Ralph Mattar, Laboratory Director

NH NASSAUX-HEMSLEY, INCORPORATED

CONSULTING ENGINEERS — CHAMBERSBURG, PA.

LABORATORY REPORT

DATE IN	June 6, 1983	DATE REPORTED	June 20, 1983
LAB NO.	724.4A (B-4)	JOB NO.	83LB01.14
CLIENT	SKF Industries	PROJECT MANAGER	R. Matter
	Digested Soil Composite		

All values are expressed as mg/l (ppm) unless otherwise noted.

MICROBIOLOGICAL	
Total Coliforms	
Fecal Coliforms	

OXYGEN-OXYGEN DEMAND	
Dissolved Oxygen	
5 Day - B.O.D.	
C.O.D.	

* METALS	
Iron (Total)	57.2
Chromium (Total)	0.6
Chromium (Hexaval)	<0.01
Copper	5.4
Zinc	6.2
Arsenic	1.23
Cadmium	<0.1
Lead	7.0
Nickel	0.7
Silver	0.2
~~Tin~~	~~0.534~~

ALKALINITY AND RELATED	
pH	9.0
P-Alkalinity	
M.O. Alkalinity	
Total Hardness	
Total Acidity	
pH 8 Acidity	

SOLIDS	
Total	
Suspended	
Total Vol.	
Total Fixed	
Susp. Vol.	
Susp. Fixed	
Settled 1 Hr.	

OTHER	
Chloride	
Ammonia Nitrogen	
Nitrate Nitrogen	
Nitrite Nitrogen	
Oil - Grease	
CN	<0.01

COMMENTS

1. All analysis via Standard Methods, 14th Edition (1975) or EPA Methods Manual (1974), unless otherwise noted.

* Digested 160 gr. of composite soil to a pH of 2.0 with HNO_3.

Results are expressed in mg?Kg of soil.

Respectfully Submitted,

Ralph Matter, Laboratory Director

NASSAUX-HEMSLEY, INCORPORATED

CONSULTING ENGINEERS CHAMBERSBURG, PA.

LABORATORY REPORT

DATE IN	June 6, 1983	DATE REPORTED	June 20, 1983
LAB NO.	724.4 (B-4)	JOB NO.	83LB01.14
CLIENT	SKF Industries	PROJECT MANAGER	R. Matter
	EPA LEACHABLE METALS		

All values are expressed as mg/l (ppm) unless otherwise noted.

MICROBIOLOGICAL

Total Coliforms	
Fecal Coliforms	

OXYGEN-OXYGEN DEMAND

Dissolved Oxygen	
5 Day - B.O.D.	
C.O.D.	

METALS

Iron (Total)	0.1
Chromium (Total)	<0.1
Chromium (Hexaval)	<0.01
Copper	1.8
Zinc	2.8
Arsenic	0.083
Cadmium	0.1
Lead	<0.1
Nickel	<0.1
Silver	0.181

ALKALINITY AND RELATED

pH	9.0
P-Alkalinity	
M.O. Alkalinity	
Total Hardness	
Total Acidity	
pH 8 Acidity	

SOLIDS

Total	
Suspended	
Total Vol.	
Total Fixed	
Susp. Vol.	
Susp. Fixed	
Settled 1 Hr.	

OTHER

Chloride	
Ammonia Nitrogen	
Nitrate Nitrogen	
Nitrite Nitrogen	
Oil - Grease	
CN	<0.01

COMMENTS

1. All analysis via Standard Methods, 14th Edition (1975) or EPA Methods Manual (1974), unless otherwise noted.

Respectfully Submitted,